

**REMARKS**

**Claim Amendments**

Claim 16 is amended to reflect the original intention in that the claim recites an expression cassette capable of directing production in said cells of a phytoene synthase derived from a **plant** and an expression cassette capable of directing production in said cells of a phytoene desaturase from a **bacteria**.

Basis for the expression cassette being a phytoene synthase from a plant and phytoene desaturase from a bacteria is described in the PCT application as filed in claims 4, 5 and 11, page 7 lines 26 to 32 and Figure 4 "Plasmid A".

Claim 31 is cancelled without prejudice.

Claim 32 is amended to depend from claim 16.

Claims 33-37 are unchanged.

Claim 38 is amended to correct the typographical error (claims amended to claim).

Claims 39 to 43 are unchanged.

Claims 44 to 59 are cancelled without prejudice.

**Examiner's Objections and Rejections**

**37 CFR 1.75(c)**

Claim 32 has been amended to depend from claim 16 and claim 31 has been deleted.

**35 USC §112**

Previous claims 53 to 59 have been deleted without prejudice thereby rendering this objection moot.

**35 USC §102**

Claims 16, 31-52 are rejected under 35 USC 102(b) as allegedly being anticipated by:

The Rockefeller Foundation, International Program on Rice Biotechnology, Workshop Report – June 10-11, 1993. (Hereinafter D1).

Burkhardt et al. Rice Genetics III. Proceedings of the Third International Rice Genetics Symposium. Khush G.S. Ed. 1996 (IRRI) pp818-820. (Hereinafter D2).

Ye et al. Science, 14 January 2000. Vol. 287, pp 303-305. (Hereinafter D3).

The Examiner states that D1 describes methods for producing rice cells that accumulate carotenoids by transformation with various genes. In particular, it is said that the reference discloses that the transformation of tobacco with genes from the entire beta-carotene pathway of *E. herbicola* produced transformed tobacco seeds that were orange due to the accumulation of carotenoids.

The Examiner also states that D2 describes the transformation of rice with the phytoene synthase and phytoene desaturase from daffodil and that phytoene accumulation was measured at 0.74µg/g dry weight.

With respect to D1, Applicants respectfully submit that this document does not disclose a method according to the amended claims.

In particular, there is no mention of a method which utilises an expression cassette capable of directing production in cells (that are normally carotenoid free) of a phytoene synthase derived from a plant; and an expression cassette capable of directing production in said cells of a phytoene desaturase derived from a bacteria. The claimed invention is therefore novel in the light of the disclosure of D1.

Furthermore, it should be borne in mind that the disclosure of D1 represents early stage discussions/experimentation by various experts in the field with a view to assessing the potential for carotenoid biosynthesis in rice.

The summary on page 1 indicates that this group of experts assembled to “..evaluate the feasibility of alternatives for introducing or activating the carotenoid biosynthesis pathway in rice endosperm”.

There is no disclosure or suggestion in this document that the production of carotenoids in rice endosperm can be achieved via the methods as currently claimed.

In addition to this, with respect to the introduction of the genes from *E. herbicola* into rice, D1 states on page 3 that the orange seeds actually died. Taken as a whole, this disclosure could equally be taken as an indication that the transfer of such genes to plants leads to non viable seeds, and thus, dissuade the person skilled in the art from pursuing this route. Applicants therefore submit that the claimed subject matter is also inventive in the light of D1.

With respect to D2, this document also fails to disclose a method according to the present claims. As stated above, D2 describes the use of a phytoene synthase and desaturase from daffodil. The amended claims are therefore novel over the disclosure of D2.

As previously stated, D2 describes that, with respect to the transformants containing the daffodil genes, several lines accumulated high levels of phytoene in the endosperm of mature seed but the accumulation of  $\zeta$ -carotene, being the product of phytoene desaturase (pds) (and thus providing that the pds gene was active), was not demonstrated.

There is no explanation in D2 about why  $\zeta$ -carotene could not be detected and there is certainly no suggestion that the provision of a phytoene desaturase from a bacteria will be functional and will yield a much larger accumulation of carotenoids as evidenced by Annex A in our previous submission.

Thus, D2, as with D1, also leaves the skilled person with no certainty about what is required to achieve carotenoid accumulation in cells that are normally carotenoid free.

With respect to D3, Applicants do not believe that this document comprises part of the state of the art under 35USC 102(b). D3 is dated January 2000 and the International application from which the present application is derived is dated 03 March 2000 claiming the priority of an application filed 05 March 1999.

In any case, D3 does not appear to have been published more than one year prior to the date of the US application (i.e. the International application) and thus we do not believe that D3 is prior art under 35USC 102(b).

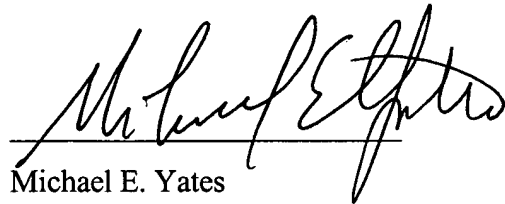
**35USC §103(a)**

The Examiner's comments in respect of claims 53-58 and 59 are no longer applicable since these claims have been deleted.

**CONCLUSION**

Applicants respectfully request entry of the foregoing amendments, continued prosecution on the merits in light of the foregoing remarks, and allowance of the pending claims. Should the Examiner consider a telephone call to the attorney for Applicants to be helpful in progressing the case to allowance one is earnestly requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Michael E. Yates", is written over a horizontal line.

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